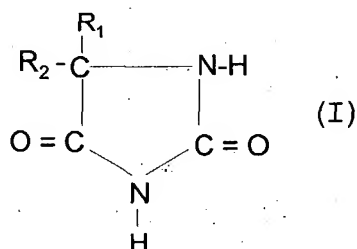


We claim:

1. A process for the preparation of an  $\alpha$ -amino acid by a reaction comprising hydrolyzing a hydantoin of the formula



in which

$\text{R}_1, \text{R}_2$ : can be identical or different, and represent hydrogen, alkyl having from 1 to 6 carbon atoms, straight-chain or branched chain; or alkylene radicals having from 1 to 6 carbon atoms which are closed to form a ring when  $\text{R}_1$  and  $\text{R}_2$  represent alkylene or, when  $\text{R}_1$  or  $\text{R}_2$  represents alkylene, are bonded to methylthio, mercapto, hydroxyl, methoxy, amino groups or halogen atoms,

$\text{R}_1$  or  $\text{R}_2$ : represents a phenyl group which is optionally substituted by methyl, hydroxyl groups or halogen atoms,

in the presence of water, ammonia and at least one metallic oxide as catalyst, selected from the group consisting of  $\text{TiO}_2$ ,  $\text{TiO}_2/\text{Al}_2\text{O}_3$ ,  $\text{Nb}_2\text{O}_5/\text{Al}_2\text{O}_3$ ,  $\text{ZnO}$  and  $\text{ZrO}_2$ , in a saponification zone under conditions in which all starting materials are completely dissolved in the water and only one further phase is present in the reactor in addition to the solid phase of the metallic oxide.

2. The process according to claim 1, wherein the reaction is carried out at a temperature of from 120 to 250°C and a pressure of from 80 to 300 bar (250,000 hPas) in the presence of carbon dioxide.
3. The process according to claim 1, wherein the ammonia, optionally in the form of a water/ammonia mixture, is mixed in an amount of from 5 to 40 moles  $\text{NH}_3$ , based on moles of hydantoin, with the hydantoin-containing solution and fed into the saponification zone.
4. The process according to claim 1 wherein said halogen atoms are selected from the group consisting of fluorine and chlorine.
5. The process according to claim 2, wherein the ammonia, optionally in the form of a water/ammonia mixture, is mixed in an amount of from 5 to 40 moles  $\text{NH}_3$ , based on moles of hydantoin, with the hydantoin-containing solution and fed into the saponification zone.
6. The process according to claim 1, further comprising feeding a water/ammonia mixture or a hydantoin-containing solution optionally containing ammonia and optionally containing carbon dioxide into the saponification zone under pressure at a temperature of from 180 to 500°C.
7. The process according to claim 3, further comprising feeding a water/ammonia mixture or a hydantoin-containing solution optionally containing ammonia and optionally containing carbon dioxide into the saponification zone under pressure at a temperature of from 180 to 500°C.
8. The process according to claim 1, wherein  $\text{R}_1$  corresponds to hydrogen and  $\text{R}_2$  corresponds to the isopropyl, 2-methylpropyl or phenyl radical or hydrogen.

9. The process according to claim 1, wherein  $R_1$  corresponds to hydrogen and  $R_2$  corresponds to the methylthioethyl radical.
10. The process according to claim 1, wherein the hydantoin is present in the hydrolysis mixture in a concentration of from 150 to 600 g/l.
- 5 11. The process according to claim 1, wherein the catalyst is  $TiO_2$  in the crystalline form anatase.
12. The process according to claim 1, wherein the metallic oxide is in the form of a fixed bed.
13. The process according to claim 1, wherein the catalyst is present in an amount of from  $> 0$  to 0.1 kg, based on 1 kg of hydantoin.
- 10 14. The process according to claim 1, wherein the process is carried out continuously, semi-continuously or discontinuously.
15. The process according to claim 1, further comprising following saponification, lowering the pressure, during the discharge from the saponification zone of a mixture obtained after the hydrolysis, separating ammonia and carbon dioxide, together with water vapour, from a liquid phase.
- 15 16. The process according to claim 15, further comprising optionally returning to the hydantoin synthesis amounts of ammonia and carbon dioxide formed in the hydrolysis reaction.
- 20 17. The process according to claim 15 further comprising feeding a remainder of the ammonia and carbon dioxide into the saponification zone at a temperature of from 180 to 500°C, and a pressure of from 80 to 300 bar.
- 25 18. The process according to claim 15 wherein the  $\alpha$ -amino acid is isolated from a separated aqueous phase.

19. The process according to claim 17 wherein a remaining portion containing unreacted hydantoin (mother solution) is mixed with fresh hydantoin-containing solution upstream of the saponification zone (hydrolysis reactor), and is fed into the saponification zone.

5 20. The process according to claim 17 wherein the temperature is 210° to 360°C.

21. The process according to claim 17 wherein the pressure is 110 to 200 bar.

22. The process according to claim 1, further comprising

10 following saponification, lowering pressure, during the discharge from the saponification zone of the mixture obtained after the hydrolysis, separating ammonia and carbon dioxide, together with water vapour, from a liquid phase,

15 optionally returning to the hydantoin synthesis a portion corresponding to the amounts of ammonia and carbon dioxide formed in the hydrolysis reaction,

feeding the remainder of the ammonia and carbon dioxide into the saponification zone at a temperature of from 180 to 500°C, and a pressure of from 80 to 300 bar,

20 isolating the  $\alpha$ -amino acid from the separated aqueous phase, mixing the remaining portion containing unreacted hydantoin (mother solution) with fresh hydantoin-containing solution upstream of the saponification zone (hydrolysis reactor), and feeding it

25 into the saponification reactor.